3. On the Osteology of Microglossa alecto. By W. K. Parker, F.Z.S.

Having been busy of late with the study of the skull and its development in the Ostrich tribe, I am the more sensitive to the peculiar ornithic excellences of the Parrot family. Indeed, but for their *livery*, it could hardly have been supposed that these opposite creatures belonged to one *house*: they are the most perfectly antithetical of all the feathered tribes.

Judged by the mere power of flight, the Parrots would not be accounted worthy to stand in so high a position; but this is only one, among many, of the talents possessed by birds of noble degree.

Like all those who glory in "high degree," the Parrots have a poor relation or two to abate their pride. The Owl-billed Parrot (*Strigops habroptilus*) of New Zealand is as lowly as "the younger son of a younger brother." If birds were to be classified by the sternum only, then the *Strigops* should be put near the *Apteryx*, and the Tinamou attached to the train of the Peacock.

If birds be ranked according to the degree of their intelligence, then, without controversy, the familiar Crows and Starlings, Finches, and Singing-birds may take the highest room; but if power of flight, mere brute strength, and savage audacity shall be considered most decent and becoming to a bird, then let the Eagles and Falcons sit on the throne of the feathered kingdom. But there are qualities, dear to the morphologist, in which the Parrots have the preeminence, and stand higher, as Birds, than all other birds; and although, all things considered, the Crow is the best type and model with which to compare the whole plumy brotherhood, yet in many things the Parrot is a bird of birds; he is an ultra-type, and sets bounds to the class to which he belongs.

But this bird, with the wise and solemn face of an Elephant, has, like us, its chief and best qualities resident in its head; and if the skull of an Ostrich be compared with that of the most psittacine of the Parrots, the difference will appear almost as great as exists between a *larva* and an *imago*.

The type under consideration is one in which the characters of the Parrot, and indeed the characters of a Bird, as such, are carried to their highest pitch. I have long been familiar with this highest kind of Psittacine skull in the genera *Plyctolophus* and *Calyptorhynchus* (see Cat. Mus. Coll. Surg. vol. i. pp. 277, 278, nos. 1440 & 1445), and have recently discovered it in the Grass-Parakeet (*Melopsittacus undulatus*); but the genus *Microglossa* carries it to the fullest degree.

The teleologist might write a fair volume on the fitnesses displayed in the skull of this bird; but the adaptive conditions are of secondary importance to him who would trace the clue of morphological unity through the mazes of nature's unutterable variety.

The first thing that strikes the eye of the observer is the cleaving of a great transverse cleft through the whole face, in front of the eyes, leaving the enormously developed intermaxillary apparatus, en-

closing the vestibular parts of the olfactory organs, on one hand, and the skull, maxillary apparatus, and true olfactory region, on the other. Then we see that not only is the eye bounded beneath by a blending of the lachrymal with the postfrontal, but the latter is anchylosed to the squamosal also; and thus, with the true zygomatic arch below, we have three pairs of facial bridges. But the deep, steep-sided, beautifully arched intermaxillaries, the fair, broad forehead, the well-roofed eyebrows, the perfectly bony orbit, and a mandible such as the eye searches for in vain elsewhere—all these are outstanding characters in the highest type of Parrots, and, above all, in the genus *Microglossa*.

The huge, mobile face is but one bone in the adult, and yet it is composed of a great variety of parts that have become blended into one thick mass, perfectly void of sutures. The nasals, intermaxillaries, prevomers (the vomer is not developed in the Psittacidæ), the nasal septum, the inferior turbinals, and the alæ nasi, all these go to form this large compound bone. There are, therefore, six splint bones; and the axial bones are four for the septum, two (at least) for the inferior turbinals, and two for the alæ nasi, thus making eight more, or fourteen bones in all. The highly complex skull also is completely fused into one bone, and it has in it the separate parts that form the auditory and olfactory sense-capsules. But the original attachment of the pieces of the arrested palato-pterygoid arch is loosened so as to let the ascending (proximal or orbital) process of the palatine lie half an inch below its proper foundation, viz. the pars plana or antorbital. Anteriorly, the palatine is thick and transversely expanded, and its convex elliptical end fits in a glenoid cavity in the end of the prevomer of the same side. Further back, at its proximal plate, it is two-thirds of an inch high, it scarcely becomes less than half an inch; and its emarginate hinder end reaches to behind the "membrana tympani," full a quarter of an inch behind the somewhat slender rod-like pterygoids. The latter bones, although an inch in length, are thus completely overlapped by the palatines. The small, late-appearing mesopterygoids have early coalesced with each other, and they have united also with the front corner of the basicranial edge of the left palatine. The malar bone articulates, like its axis, the palatine, with the prevomer. The epipterygoid process of the pterygoid is obsolete; the metapterygoid process of the quadrate bone is small, conical, and anteriorly placed, as in its autogenous counterpart in the non-venomous Serpents. The hinge-convexity of the quadrate bone is semicircular; the cupped process for the jugal is large and projecting; and a well-developed, outstanding, oval condyle is received by the cup at the end of the pterygoid. The heads of the os quadratum—answering to the crura of our anvil-bone ("incus")—are well developed, but do not stand as in other birds; for that which is related to the sympletic cartilage of the stapes is directly *inside* the outer or prootic head. In birds generally, this incus-head projects far backwards, overlapping the opisthotic, and overshadowing the auditory "fenestræ," to articulate with the exoccipital. The splints of the lower jaw, ten in

number, have all become one piece, as unlike as possible to the simple Meckelian rod on which they were modelled. The symphysis is an inch in extent, and the bone is transversely flattened below, so as to be an inch wide at what should be the intermandibular angle; this is, there, a gently concave transverse margin having a rounded edge. The greatest height of the mandible is $1\frac{1}{4}$ inch; the angular process passes further back than the exoccipital. The occipital condyle is an extremely neat hemisphere. The scooped occipital plane forms a very obtuse angle with the basis cranii, which latter region is very small, triangular, and protected by sharp ridges that meet at the fore angle of the coalesced basitemporals, below the small, closely placed Eustachian openings. At first the "rostrum" of the basisphenoid is sharply carinate, then it becomes thick, rounded, and covered with articular cartilage, under which the palatines and anterior ends of the pterygoids glide. The height of the skull is so great that, although the hemispheres of the brain lie down between the eyes more than in most birds, yet the compressed rostrum of the basisphenoid and the lower edge of the perpendicular ethmoid do, together, make a great keel, larger than the sternal keel of the Love-bird (*Agapornis pullaria*). The anterior pterygoid processes are thrown out of relation to the pterygoids, which grow no spur to answer to them; they are dull forthstanding prickles. The exoccipitals are not nearly so much scooped to make a drum-cavity as in the smaller Parrots; the tympanics, like the columellæ, are lost. The main piece is large in some of the smaller kinds. In front of the great cranio-facial hinge, the nasals and nasal processes of the intermaxillaries are converted into the merest swollen sponge; behind the hinge, on each side, the lachrymals are also swollen; but the frontals dip to form a valley between the orbits. Then there is a pair of frontal, and another pair of parietal, smooth, large, rounded swellings, with a shallow, equally smooth valley between them. The width of the head is nearly two inches at the point where the postorbital process of the frontal melts into the postorbital spur of the alisphenoid (post-frontal proper). Below and behind this point it is more than two inches wide. The junction of the thick quadrate splint (squamosal) with the post-frontal spur is so extensive as almost to cover in the small heart-shaped "temporal fossa." This bridge of bone is half an inch across. The optic foramina are about one-third of an inch apart; the olfactory fissures are at the same distance. There is an elegant, small, shell-like middle turbinal on the front of the self-developed "*pars plana*," or antorbital, and the simple crus of the ethmoid curls upon itself, so as to form an upper turbinal. There are evidently full two coils to the inferior turbinals, which are ossified in a fenestrate manner, as in mammals, and which project far beneath the alæ nasi. These latter are ossified separately in the Parrots, and then, in many instances as in this, acquire an adhesion with the nasals and the inferior turbinals. The outstanding spurs of the antero-inferior septal bone increase the complexity of the nasal labyrinth.

The sternum has its fenestræ nearly filled up. The sternal keel

is, as in Parrots and many of their nearest allies, coincident with the upturned, somewhat bifurcate episternal process. This is perfectly normal; for the keel, the episternal process, and the coracoid grooves really belong to the shoulder-girdle; together they form the true episternum or manubrium. This might be called "omo-sternum," in contradistinction to the rib-sternum ("pleuro-sternum"), or that which relates to the *inner* cartilaginous belts, which grow directly from the *centra* of the vertebræ *. The furcular bone is only apparently simple, although in this specimen of *Microglossa* no sutures can be seen. In the Ash-coloured Parrot (*Psittacus erythacus*), however, and in the East-Indian *Palæornis torquata*, the thick, broad end of each ramus is seen to be a separate piece. This is also to be seen in the Toucan (*Ramphastos toco*) and in the Kingfisher (*Alcedo ispida*), but is still better developed in all the "Raptores" and Totipalmatæ, in the *Balæniceps* and *Umbretta*, and, in a less degree, in most typical Herons. I have already spoken of this part (P. Z. S. 1864, p. 339 *et seq.*), and may now say that it is a rudiment of the so-called "clavicle" of the Batrachian, Chelonian, and African Ostrich, and is well seen as a distinct bone in the shoulder-girdle of the Salmon tribe and some other allied Fishes. In Birds this rudiment is *proximal*; in Mammals, generally, it is *distal* or sternal; but I have found such a piece at both ends of the clavicle in certain Insectivora, *e. g.* the Mole (*Talpa europæa*), and in the Shrew (*Sorex tetragonurus*). In Lizards the counterpart of this cartilage is the anterior boundary of the coraco-acromial fenestræ. The supposed rudiment of the clavicle in certain small Parrots, *e. g.* the Love-Bird (*Agapornis pullaria*) and the Grass-Parakeet (*Melopsittacus undulatus*), is an ossification of this acromial cartilage. In *Psephotis multicolor* neither this nor the furcular bone is present.

4. Note on the Breeding of a Ground-Pigeon in the Society's Menagerie. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

In the 'Proceedings' of this Society for 1863 (p. 377) I gave a short notice of a Ground-Pigeon of the genus *Phlogœnas*†, of which the Society had then recently received four living examples, together with a figure of the bird drawn from life (pl. xxxiv.), and, supposing it to be undescribed, proposed to call it *Phlogœnas bartletti*. One of these fine birds having recently died, an opportunity has occurred of making a more careful examination of it than was possible when the bird was alive.

* I would remark that, to trace the affinities of the Parrot tribe, we should take such forms as the Common Grey Parrot (*Psittacus erythacus*), *Nestor*, *Psephotis*, &c., in which the Psittacine characters are somewhat enfeebled. I have not found any other "family" so isolated as this.

† This term is written by Reichenbach (its proposer) *Phlegœnas*; but *Phlogœnas* (φλογὸς and οἰνὰς) would seem to be more correct.